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(54) **Neukinase, a downstream protein of neuregulin**

(57) The present invention relates to neukinase, a downstream protein kinase in the neuregulin signaling pathway. In certain aspects, the present invention provides isolated neukinase-encoding nucleic acids, neukinase polypeptides, oligonucleotides that hybridize to neukinase nucleic acids, and expression vectors containing neukinase-encoding sequences. The present invention further provides isolated host cells, antibodies, trans-

genic non-human animals, compositions, and kits relating to neukinase. In other aspects, the present invention further provides methods of identifying predisposition to cardiac dysfunction, methods of detecting the presence of neukinase, neukinase nucleic acid, methods of screening for agents which affect neukinase activity, and methods of modulating neukinase activity.

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## EUROPEAN SEARCH REPORT

Application Number  
EP 12 15 4752

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 99/49062 A1 (GENE LOGIC INC [US]; PRASHAR YATINDRA [US]; FAN WUFANG [US]) 30 September 1999 (1999-09-30) * the whole document *	1-19	INV. C12N15/11 C12N15/12 C12N15/52 C12N15/63
X	----- "THE TRANSCRIPTIONAL LANDSCAPE OF THE MAMMALIAN GENOME", SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, US, WASHINGTON, DC, vol. 309, 2 September 2005 (2005-09-02), pages 1559-1563, XP008055983, ISSN: 0036-8075 * the whole document *	1-19	C12N15/85 C12N15/86 C12N9/48 C12N5/16 C12N5/22 C07H21/00 C07K16/16
X	& DATABASE UniProt [Online]  11 October 2005 (2005-10-11), "RecName: Full=Putative myosin light chain kinase 3; EC=<A HREF="http://srs.ebi.ac.uk/srsbin/cgi-bin/wgetz?enzyme-ECNumber:2.7.11.18]+-e">2.7.11.18</A>;", retrieved from EBI accession no. UNIPROT:Q3UIZ8 Database accession no. Q3UIZ8 * the whole document *	1-19	ADD. A61K38/45 C07K16/40 C12Q1/48 G01N33/68
X	& DATABASE EMBL [Online]  6 September 2005 (2005-09-06), "Mus musculus 17 days embryo heart cDNA, RIKEN full-length enriched library, clone:I920041I20 product:Weakly similar to myosin light chain kinase homolog [Mus musculus], full insert sequence.", retrieved from EBI accession no. EMBL:AK146683 Database accession no. AK146683 * the whole document *	1-19	TECHNICAL FIELDS SEARCHED (IPC)  C12N
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1 <del>The present search report has been drawn up for all claims</del>			
Place of search Munich		Date of completion of the search 12 June 2012	Examiner Seranski, Peter
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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## EUROPEAN SEARCH REPORT

Application Number  
EP 12 15 4752

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 03/100046 A1 (BAYER HEALTHCARE AG [DE]; LIOU JIING-REN [US]) 4 December 2003 (2003-12-04) * page 123; sequence 5 * -----	1-19	C12N9/12
			TECHNICAL FIELDS SEARCHED (IPC)
<del>The present search report has been drawn up for all claims</del>			
Place of search Munich		Date of completion of the search 12 June 2012	Examiner Seranski, Peter
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03/02 (P04C01)



Application Number

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-19 (partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION**  
**SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-19(partially)

Isolated nucleic acid encoding a polypeptide comprising an amino acid sequence having at least 70% identity to Seq-ID-N°25; Vector comprising said polynucleotide; host cell comprising said vector; antibody binding to said polypeptide; transgenic non-human animal expressing said nucleic acid; method of detecting said nucleotide; composition comprising said polypeptide; kit comprising said nucleic acid; method of producing said polypeptide.

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2. claims: 1-19(partially)

Isolated nucleic acid encoding a polypeptide comprising an amino acid sequence having at least 70% identity to Seq-ID-N°2; Vector comprising said polynucleotide; host cell comprising said vector; antibody binding to said polypeptide; transgenic non-human animal expressing said nucleic acid; method of detecting said nucleotide; composition comprising said polypeptide; kit comprising said nucleic acid; method of producing said polypeptide.

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 15 4752

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-06-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		CA 2323574 A1	30-09-1999
		EP 1073756 A1	07-02-2001
		WO 9949062 A1	30-09-1999
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